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Reply to Office action of June 24, 2005

REMARKS / DISCUSSION OF ISSUES

This Amendment and Response is intended as a complete response to a non-final Office Action dated June 24, 2005. Claims 1-14 and 16-20 stand rejected, while claim 15 is objected to. In view of the foregoing amendments and the following discussion the Applicants submit that all of the pending claims are in condition for allowance. Reconsideration of the subject application is earnestly solicited.

The subject application was previously appealed to the Board of Appeals. After consideration of Applicants' Brief further opportunities to advance the subject application to allowance have been provided. The Applicants thank both the Office for those opportunities and the Examiner for his efforts in prosecuting the subject application.

The Office action rejected claims 1-3, 14, 16-17, and 19 under 35 U.S.C. §103(a) over Admitted Prior Art (APA) in view of Haruhiko (JP No 07-1999866) and Murade (US 6,330,044 B1). With all respect to the Examiner that rejection is traversed.

Applicant's APA relates to LCD devices comprised of imaging pixels arranged in a matrix of rows and columns. Each imaging pixel includes a pixel-switching device having first and second terminals and a control terminal that controls switching between the first and second terminals. A pixel storage device is associated with each imaging pixel. Data lines connect "columns" of second terminals together; data drivers connect to the data lines, and the data drivers apply image data to the data lines. Scanning lines connect the pixel-switching device control terminals into rows, and scanning signals on the scanning lines control the operations of the pixel-switching devices. By driving columns of pixel-switching devices with image data while selectively applying scanning signals the desired image data can be selectively stored in the pixel storage devices such that the LCD produces a desired composite image.

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Practical implementations of LCD devices in accord with the APA address various issues. One set of issues relates to driving the data lines. For various reasons it is desirable to drive a data line using one stored charge polarity (for example positive) in one period and the opposite stored charge polarity (negative) in the next period. It is also beneficial to use opposite charge polarities in adjacent data lines. To reduce power consumption Haruhiko teaches selectively connecting adjacent data lines together in *non-imaging* periods such that charges in adjacent data lines neutralize each other. To do so Haruhiko teaches shorting switches that selectively short adjacent lines together during non-imaging periods.

In contrast to the foregoing, independent claim 1 recites, among other things:

> "at least one switch responsive to a corresponding control signal to selectively connect two of the data lines to each other such that <u>image data applied by a data driver is simultaneously applied to at least two data lines.</u>"(emphasis added.)

Independent claim 8 recites, among other things:

> "connecting the defective column line to a second column line of the plurality of column lines by applying a control signal to selectively close a switch <u>such that image data applied to the second column line is applied to the defective column line.</u>"(emphasis added.)

Independent claim 16 recites, among other things:

> "means for selectively connecting two column lines to each other such that <u>image data applied by a data driver is simultaneously applied to two data lines.</u>" .(emphasis added.)

Patentable differences between the pending independent claims and permissible combinations of APA and Haruhiko include that in the pending independent claims columns are selectively connected together such that *image data* on one data line is switched onto another data line. This enables a controlled "repair" of defective lines by reducing the impact of defective drivers/ lines. Instead of a defect causing a "blank" line a "defective" line is driven by image data from an adjacent driver. This markedly reduces the impact of the defect. In contrast, neither

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the APA nor Haruhiko teach simultaneously connecting data lines together during *imaging* periods.

Recognizing the very different operation of the subject invention as defined by the pending independent claims over the APA and Haruhiko, the Office action relies on Murade as teaching image data being applied by a data driver simultaneously to two data lines, referencing Murade, Figure 3, item 3, 109, and column 11, lines 56-67. With all respect to the Examiner his understanding of Murade is incorrect.

Murade at column 11, lines 56-67 discloses that multiple data lines can be driven simultaneously by *different* data drivers. However, the present invention recites driving multiple (two) data lines with imaging data from *one* driver. In fact, the operation of items 109 is not described until column 12, lines 23-48. There, Murade teaches that items 109 are used to "pre-charge" the data lines during a "period of a horizontal retrace line of the image signal." This allows a biasing pre-charge to be applied during "*non-imaging*" times. In addition, or in the alternative, column 12, lines 23-48 describe the use of items 109 during inspection. However, Murade does not teach or suggest connecting data lines together so that *one data driver can drive both lines during imaging*.

Consequently, Murade does nothing to close the vast difference between the invention defined by the pending independent claims and the prior art of the APA and Haruhiko. Consequently, the pending independent claims (1, 8, and 16) are allowable over any permissible combination of the APA, Haruhiko, and Murade. As claims 2-3, 14, 17, and 19 depend either directly or indirectly on allowable base claims, and as claims 2-3, 14, 17, and 19 include all of the limitations of their base claim, claims 2-3, 14, 17, and 19 are allowable. Accordingly, withdrawal of the 35 U.S.C. §103(a) rejection of claims 1-3, 14, 16-17, and 19 is respectfully requested.

The Office action also rejected claims 3 and 18 under 35 U.S.C. §103(a) over Admitted Prior Art (APA), Haruhiko, and Murade and in further view of Keeney et al. (Pub. No. US 2002/0113766 A1). With all respect to the Examiner that rejection is traversed.

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The Admitted Prior Art (APA), Haruhiko, and Murade are discussed above. Keeney teaches repairing inoperative pixels by disconnecting the pixels from their drivers and then reconnecting the inoperative pixels to another driver. Keeney specifically teaches the use of bypass latches and multiplexers to selectively connect individual pixels to driver circuitry. However, Keeney does not suggest selectively connecting a defective data line to another data line during *imaging* periods such that one driver can drive both data lines. In fact, Keeney discloses (see paragraph 34) that defective column lines render an entire display unstable and suggests adding spare rows and columns.

Consequently, Keeney does nothing to close the substantial gap between the pending independent claims and permissible combinations of APA, Haruhiko, and Murade. All permissible combinations of APA, Haruhiko, Murade and Keeney fail to suggest LCD operations such that "image data applied by a data driver is simultaneously applied to at least two data lines" (see claim 1), or that image data applied to a second column line is applied to a defective column line (see claim 8). As claim 3 depends from allowable claim 1 and includes all of the limitations of that claim, claim 3 is allowable. As claim 18 depends from allowable claim 16 and includes all of the limitations of that claim, claim 18 is allowable. Accordingly, withdrawal of the 35 U.S.C. § 103(a) rejection of claims 3 and 18 is respectfully requested.

The Office action also rejected claims 4, 6, and 20 as being unpatentable over the Admitted Prior Art (APA), Haruhiko and Murade, and in further view of Lee et al. (US 6,028,442). With all respect to the Examiner that rejection is respectfully traversed.

The teachings of Admitted Prior Art (APA), Haruhiko and Murade are discussed above. Lee teaches testing groups of data lines by shoring numerous data lines together and then applying a test voltage to the shorted lines. While Lee may teach a useful method of testing an LCD, Lee does not teach or suggest

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connecting two adjacent columns together and then driving them both with image data.

Consequently the pending independent claims remain allowable over any permissible combination of the Admitted Prior Art (APA), Haruhiko, Murade, and Lee. As claims 4, 6, and 20 include all of the limitations of their base claims, claims 4, 6, and 20 are also allowable. Accordingly, withdrawal of the 35 U.S.C. § 103(a) rejection of claims 4, 6, and 8 is requested.

The Office action rejected claims 5 and 7 as being unpatentable over the Admitted Prior Art (APA), Haruhiko, Murade, Lee, and Keeney. With all respect to the Examiner that rejection is respectfully traversed.

The teachings of the Admitted Prior Art (APA), Haruhiko, Murade, Keeney, and Lee are all discussed above. No permissible combination of those references suggests LCD operations such that "image data applied by a data driver is simultaneously applied to at least two data lines" (see claim 1). Consequently claim 1 remains allowable over Admitted Prior Art (APA), Haruhiko, Murade, Keeney, and Lee. As claims 5 and 7 depend from allowable claim 1 and include all of the limitations that claim, claims 5 and 7 are also allowable. Accordingly, withdrawal of the 35 U.S.C. § 103(a) rejection of claims 5 and 7 is requested.

The Office action also rejected claims 8-9, and 13 as being unpatentable over Henley (US patent 5,459,410) in view of Haruhiko and in further view of Murade. With all respect to the Examiner that rejection is respectfully traversed.

The teachings of Haruhiko and Murade are both discussed above. Henley teaches an LCD inspection process in which repairable defects are identified and corrected early in the manufacturing process. Open and shorted lines (columns and rows) are identified and repaired by deposing conductive material or by laser ablation.

Claim 8 recites, among other things:

> "connecting the defective column line to a second column line of the
> plurality of column lines by applying a control signal to selectively close a

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> switch such that image data applied to the second column line is applied to the defective column line.

No permissible combination of Henley, Haruhiko, and Murade teach or suggest selectively closing a switch such that image data applied to a second column line is applied to a defective column line. Consequently, claim 8 is allowable over Henley, Haruhiko, and Murade. Furthermore, claims 9, and 13 depend from allowable claim 8, include all of its limitations, and are thus allowable. Accordingly, withdrawal of the 35 U.S.C. § 103(a) rejection of claims 8-9 and 13 is requested.

The Office action also rejected claim 10 as being unpatentable over Henley, Haruhiko and Murade in view of Keeney et al. With all respect to the Examiner that rejection is respectfully traversed.

The teachings of Henley, Haruhiko, Murade, and Keeney are all discussed above. No permissible combination of Henley, Haruhiko, Murade, and Keeney teach or even suggest selectively closing a switch such that image data applied to a second column line is applied to a defective column line as recited in claim 8. Consequently, claim 8 is allowable over of Henley, Haruhiko, Murade, and Keeney. Furthermore, claim 10 depends from allowable claim 8, includes all of its limitations, and is thus also allowable. Accordingly, withdrawal of the 35 U.S.C. § 103(a) rejection of claim 10 is requested.

The Office action also rejected claim 12 as being unpatentable over Henley, Haruhiko, and Murade in view of Lee. With all respect to the Examiner that rejection is respectfully traversed.

The teachings of Henley, Haruhiko, Murade and Lee are all discussed above. No permissible combination of Henley, Haruhiko, Murade and Lee teach or even suggest selectively closing a switch such that image data applied to a second column line is applied to a defective column line as recited in claim 8. Consequently, claim 8 is allowable over Henley, Haruhiko, Murade and Lee. Furthermore, claim 12 depends from allowable claim 8, includes all of its limitations,

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and is thus also allowable. Accordingly, withdrawal of the 35 U.S.C. §103(a) rejection of claim 12 is requested.

The Examiner is thanked for the indication that claim 15 includes allowable subject matter. However, at this time the Applicants chose not to amend claim 15 to bring it into a form for immediate allowance. But, the Applicants wish to reserve the right to do so in the future, in either this or in a related application.

In view of the foregoing, the Applicants respectfully request that the Examiner withdraw the rejections of record, allow all the pending claims, and find the application in condition for allowance.

If any points remain in issue that may best be resolved through a personal or telephonic interview, the Examiner is respectfully requested to contact Mr. Eric M. Bram of Philips Intellectual Property & Standards at (914) 333-9635. All correspondence should continue to be sent to the address of record (not to the signing attorney).

Respectfully submitted,

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